

# Oxygen-Free Electronic Copper - UNS C10100



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## Typical Analysis of C101 Copper

|        |          |
|--------|----------|
| Copper | >=99.99% |
|--------|----------|

**Applications:** busbars, bus conductors, waveguides, hollow conductors, lead-in wires and anodes for vacuum tubes, vacuum seals, transistor components, glass to metal seals, coaxial cables, klystrons, microwave tubes, and rectifiers.

**Processing:** Excellent hot and cold workability; good forgeability. Fabricated by bending, coining, coppersmithing, drawing and upsetting, hot forging and pressing, knurling, roll threading, shearing, spinning, swaging, and stamping.

**Corrosion Resistance:** Good to excellent. Susceptible to galvanic corrosion when coupled with iron, aluminum, magnesium, lead, tin, and zinc. Good resistance to atmospheric, brackish water, sea water, and non-oxidizing acid corrosion, but avoid heating in oxidizing atmospheres or exposing to oxidizing acids, moist halogens, sulfides, ammonia, or solutions with ammonium ions.

| Physical Properties        | Metric                     | English  | Comments                               |
|----------------------------|----------------------------|--|--|
| Density                    | 8.89 - 8.94 g/cc           | 0.321 - 0.323 lb/in <sup>3</sup>                 |  |
| Mechanical Properties      | Metric                     | English  | Comments                               |
| Hardness, Vickers          | 75.0 - 90.0                | 75.0 - 90.0                                      | ½ hard                                 |
|                            | 90.0 - 105                 | 90.0 - 105                                       | full hard                              |
| Tensile Strength, Ultimate | 221 - 455 MPa              | 32100 - 66000 psi                                | Varies with heat treatment.            |
| Tensile Strength, Yield    | 69.0 - 365 MPa             | 10000 - 52900 psi                                | Varies widely with heat treatment.     |
| Elongation at Break        | 55.00%                     | 55.00%   | in 101.6 mm (4 in.)                    |
| Modulus of Elasticity      | <u>115 GPa</u>             | <u>16700 ksi</u>                                 |  |
| Poissons Ratio             | 0.31                       | 0.31   |  |
| Machinability              | 20%                        | 20%  | UNS C36000 (free-cutting brass) = 100% |
| Shear Modulus              | <u>44.0 GPa</u>            | <u>6380 ksi</u>                                  |  |
| Electrical Properties      | Metric                     | English  | Comments                               |
| Electrical Resistivity     | <u>0.00000171 ohm-cm</u>   | <u>0.00000171 ohm-cm</u>                         | at 20° C (68°F)                        |
| Thermal Properties         | Metric                     | English  | Comments                               |
| CTE, linear                | <u>17.0 µm/m-°C</u>        | <u>9.44 µin/in-°F</u>                            |  |
|                            | @Temperature 20.0 - 100 °C | @Temperature 68.0 - 212 °F                       |  |
|                            | <u>17.3 µm/m-°C</u>        | <u>9.61 µin/in-°F</u>                            |  |
|                            | @Temperature 20.0 - 200 °C | @Temperature 68.0 - 392 °F                       |  |
|                            | <u>17.7 µm/m-°C</u>        | <u>9.83 µin/in-°F</u>                            |  |
|                            | @Temperature 20.0 - 300 °C | @Temperature 68.0 - 572 °F                       |  |
| Specific Heat Capacity     | <u>0.385 J/g-°C</u>        | <u>0.0920 BTU/lb-°F</u>                          | 20°C                                   |
| Thermal Conductivity       | 383 - 391 W/m-K            | <u>2660 - 2710</u> BTU-in/hr-ft <sup>2</sup> -°F | 20°C                                   |
| Melting Point              | <u>1083 °C</u>             | <u>1981 °F</u>                                   |  |